

GUIDELINES FOR MAINTENANCE OF IHS-OWNED FACILITIES /
LEAD-BASED PAINT HAZARDS: TESTING, TREATMENT, AND
CONTROL

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111-2.1.1 PURPOSE

This chapter provides technical information on how to control potentially hazardous conditions in IHS facilities including health care and quarters caused by lead-based paint (LBP). The intent is to assist facility management, real property, environmental health, and other staff in complying with the regulations of the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and the United States Department of Housing and Urban Development (HUD) pertaining to exposure to LBP.

This chapter also provides directions at minimizing exposure to LBP from two perspectives. The first perspective is that of an occupant of government quarters and the need to meet the EPA regulations and the Centers for Disease Control and Prevention (CDC) guidelines which apply to that environment. The second is from that of an employee of IHS working in a government facility

and the OSHA, and EPA regulations that apply to that environment.

111-2.1.2 INTRODUCTION

Twenty years ago children and adults were exposed to many more sources of lead, including leaded gasoline, lead solder in cans of food, lead plumbing, even leaded bathtubs. In the 1940s and 1950s, children's deaths from lead poisoning were common. With increased awareness and bans on many lead-containing products, the degree of lead exposure was considerably reduced. There are about 20 million children in the US under the age of six. Of these, the EPA estimates that about 9 percent, or 1.7 million children are now being affected by exposure to high levels of lead. Today, the primary sources of exposure are through deteriorated LBP, and the resulting lead dust in their homes and in the soil surrounding their homes.

The amount of lead allowed in paint was reduced in 1960 and banned for residential use in 1978. Therefore, any structure built before 1978 may contain LBP and those built before 1960 are very likely to contain LBP. According to EPA, approximately three-quarters of the nation's houses built before 1978 contain some LBP. IHS owns at least 122 homes built before 1960 and over 1080 homes built before 1978. Now, house paint contains very low levels of lead. According to HUD standards, any paint, varnish, shellac or other coating that contains lead with a concentration of at least 1.0 milligrams per square centimeter (mg/cm^2), or with at least 0.5 percent lead by weight is considered LBP. It has been reported that some seaside homes in Alaska are painted with marine paint, a LBP resistant to the harsh coastal conditions. This type of paint is not meant for residential purposes and should not be used for homes.

LBP is in nearly two-thirds of the nation's homes and is the most common residential environmental hazard. However, the mere presence of LBP in a home does not mean that a hazard exists. The condition of paint is most important in determining risk. Homes with deteriorating, peeling LBP constitute the greatest risk to children and require action to prevent lead poisoning. Homes with intact lead paint can also become hazardous if renovation work is performed which disturbs the paint.

LBP can contribute to high lead levels in indoor dust, paint chips, and soil. Most homes built before 1960 contain high levels of leaded paint and many homes built before 1978 also contain lead paint. LBP can be found on window frames, walls, doors, outdoor house paint and many other painted surfaces. Even playground equipment, fences, old toys, and furniture can be

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found to be painted with LBP. A recent discovery was made that vinyl mini-blinds manufactured in foreign countries are high in lead and that they release lead dust when exposed to sunlight. As a result, any vinyl (plastic, easily bendable) mini-blinds found in homes occupied by children should be discarded immediately. New vinyl mini-blinds will be clearly labeled as "lead-free". Metal mini-blinds have not been identified as a hazard.

The act of removing LBP can also create a hazardous environment for workers and occupants. Some removal techniques create a serious dust hazard and should never be used. Techniques such as sanding or dry scraping, or using tools such as propane torches or heat guns can increase indoor leaded dust or fume to extremely dangerous levels. Certified personnel and proper procedures are necessary to identify LBP and to remove it or render it safe.

Lead dust is very difficult to remove by cleaning and may remain in the house even after a thorough cleaning. Adults and children can be exposed to dangerous levels of lead by inhaling lead laden dust. Children may become lead poisoned by playing on floors contaminated with lead dust and putting their hands in their mouths. Children can also increase their lead levels by playing outside the house in soil contaminated by peeling and deteriorated exterior paint.

111-2.1.3 LEGISLATION

Congress passed the Residential Lead-Based Paint Hazard Reduction Act of 1992, also known as Title X of the Housing and Community Development Act of 1992 (Public Law 102-550). Title X established the standards required to reduce LBP hazards in housing. The intent of this law is to protect families from deteriorating lead paint in residential property.

- A. Occupant Notification - The EPA and HUD are required by Title X to issue joint regulations to protect people who buy or lease houses with LBP or LBP hazards. Effective in September 1996, Federal law requires that housing owners including government agencies, notify prospective buyers and renters of known LBP and/or LBP hazards in any house built before 1978. A house is "exempt" if it is not a bedroom dwelling or if it is exclusively for the use of the elderly or persons with disabilities, unless a child is expected to live there. Effective in September 1995, Title X, Section 1013, Disposition of Federally Owned Housing, also set requirements for testing and abatement.
- B. Certification - Title X requires individuals and firms who

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conduct LBP inspections, risk assessments, and abatement projects be trained and certified. Managers have the option of sending employees for training at any of the more than 30 university and private programs which are currently offering nationally recognized training curricula. For the program nearest you, call the National Lead Information Center Clearinghouse at 1(800)424-LEAD or your regional EPA office (see Appendix F).

In August 29, 1996, the EPA issued regulations requiring anyone who evaluates or abates LBP to be trained by an accredited program, see (Appendix B) for definitions of inspector and risk assessor. There will be few contractors qualified for this work for several years, and they can be expensive. For cost savings, it would be prudent for IHS and tribal environmental managers to become certified in lead inspection and risk assessment. While these regulations take effect on August 30, 1999, it is cost-effective for IHS to comply now.

111-2.1.4 HEALTH EFFECTS

Lead poisoning is a leading environmental threat and in high concentrations can cause permanent brain damage. It can also damage the kidneys, the gastrointestinal tract, the peripheral and central nervous systems, the reproductive system, and the blood-forming organs. In children, lead can cause behavioral problems and reduced intelligence. In adults, it can cause anemia, excessive fatigue, tremors, high blood pressure, anxiety, muscle and joint pain, sexual impotence, and weakness. Other signs of lead poisoning are a pigmentation on the gums called a "lead line" and the inability to keep the hand and arm fully extended called a "wrist drop". Once lead is absorbed, it accumulates in the blood, soft tissues, and bone. It is stored in bone for decades and is slowly released which can result in a chronic toxicity. In high concentrations, lead poisoning causes coma, convulsions, and death. Unborn babies can also be affected if the mother absorbs lead from the environment.

111-2.1.5 IMPLEMENTATION

- A. Government Quarters - The IHS has the responsibility to provide safe housing. All quarters constructed prior to 1978 will require a risk assessment and a paint inspection. In homes confirmed or presumed to contain LBP, IHS is obligated to minimize potential exposure using the methods described in this document. Areas or Service Units need to prioritize the process so that the oldest facilities are

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assessed first, and as resources allow, homes constructed later will also be evaluated.

According to Title X, paint inspections must be performed by trained and certified workers. It is necessary to have IHS employees trained and certified, otherwise, certified individuals and firms must be used.

Any public facility may be considered a child occupied facility if a child is in the facility a total of six hours per week, consisting of at least two occasions for three hours each visit. Hospital pediatric playrooms, pediatric inpatient ward, day care centers, or other facilities that meet the definition of a "child-occupied facility" must be evaluated in a similar fashion to residences. See (Appendix B) for a definition of child-occupied facility. This distinction may be important for environmental health staff consulting to tribal entities. It will have minimal impact on IHS health care facilities because they will require the same evaluation in order to comply with the OSHA requirements.

- (1) Notification - Real property officers/housing officers will serve as the point of contact for information for residents on protection from exposure to LBP. They will be responsible for the dissemination of the necessary disclosure information.

The Service Unit must provide the tenant of homes built before 1978 with any available lead hazard records or evaluation reports dealing with the presence of LBP or LBP hazards before signing the lease. The Service Unit must give the tenant a copy of the EPA handbook Protect Your Family From Lead In Your Home. Tenants who are renewing leases must also receive a copy of the handbook.

The Headquarters Real Property Management Branch will assume a lead role in monitoring the above activities, and at the service units, the housing officers will serve as the point of contact.

A sample disclosure form and a copy of the EPA handbook are included in this document, see (Appendices C and D). The handbook is also available to the public on the Internet: <http://www.epa.gov/opptintr/lead> or <http://www.hud.gov>. Printed pamphlets are available by calling 1(800)424-LEAD and were designed for distribution to families in an easy to read format.

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Title X does not invalidate existing leases. Title X is consistent with the IHS policy, refer to (Chapter 13 of the Indian Health Manual, Quarters Management Program, 5-13.2), to ensure the availability of safe, suitable housing for personnel.

- (2) Lead Based Paint Inspection (Sampling and Analysis) - A paint inspection involves testing all painted and coated surfaces in the home, both indoors and outdoors, including doors and trim. There are three methods to sample and analyze LBP.

- a. The spot chemical test methods are only a screening evaluation and will be used only in limited circumstances, by staff who are certified as inspectors or risk assessors and they can not be used to meet inspection standards.
- b. XRF analyzer testing is the preferred method of determining lead content in paint because it is fast, cost-efficient, and non-destructive. The disadvantage is that it is less accurate than laboratory analysis. It can only be used on surfaces where the paint is intact and cannot be used over irregular or curved surfaces.

The XRF instruments contains potentially hazardous radioactive isotopes and emit X-rays and gamma radiation. The proper use of this instrument is vital to protect the operator and other people in the area. All operators must be trained by the manufacturer of the instrument. Operators must also be certified. Any contractor who operates an XRF instrument must have the appropriate Federal or State licenses or permits and must meet any applicable State law or notification requirement.

- c. Laboratory analysis is accomplished by taking samples of paint chips from every painted surface in the house. The disadvantages are that it is costly, time-consuming, and damages many painted household surfaces. The advantage of laboratory analysis is that it is the most accurate method, including XRF analysis.

An acceptable sample would be a 2.5 centimeters (cm) by 2.5 centimeters (cm) with all paint layers removed. A knife is used to scrape the section of paint down to the bare wood or plaster. If any

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wood or plaster is removed with the paint sample, the results will not be accurate. Every sample must be packaged separately in a clean sample container and labeled to correlate with an exact location of the surface and house where it was taken. As stated before, only trained workers may do this.

Laboratory analysis is required if XRF analysis is inconclusive or impossible to take due to a deteriorated or an inaccessible painted surface.

- (3) Risk Assessment - The risk of being exposed to lead paint depends on several factors. The condition of the paint is very important in determining how much leaded dust or paint chips are available for human exposure. Any lead in paint is a potential hazard but lead becomes an immediate hazard when it is:

- a. chipping, peeling or flaking;
- b. disturbed through repainting or remodeling;
- c. chalking (producing lead dust);
- d. on a part of a window, door or stair tread which is subject to friction;
- e. on any surface which is walked on or is subject to wear; or
- f. can be mouthed or chewed by a child.

A risk assessment must be performed to determine the degree of risk from LBP in a dwelling. As with paint inspections, Title X requires that risk assessments be conducted by trained and certified workers.

The risk assessment is a visual inspection of the property and the condition of the paint, its age and any history of painting, any historical significance of the structure which may need to be preserved, future use of the property by children under 7 years old, and environmental samples of dust in the house and surrounding soil for lead analysis. The risk assessment report incorporates all of these factors and recommends an acceptable abatement technique as well as appropriate interim control strategies which can be used to control any of the hazards prior to permanent abatement. All sources of LBP on the property must be identified because an occupant may have used LBP at some time.

- (4) Occupational Health and Worker Protection - Any

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building constructed before 1978 should be assumed to contain lead paint unless sampled and determined to be lead free. OSHA requires that an initial exposure assessment be conducted for all jobs involving lead or lead-containing materials. Therefore, before any job begun that involves painted surfaces, a paint inspection should be conducted to identify if LBP will be involved.

The two applicable OSHA regulation to lead paint activities are; the Construction Standard for Lead (29 CFR 1926.62), and the General Industry Standard (29 CFR 1910.1025).

- a. Exposure assessment/air monitoring: In summary, unless air sampling has been performed during this activity or an activity closely resembling it under similar conditions, and found to not cause air borne concentrations above the Permissible Exposure Limit (PEL), one must assume exposure exceeds the PEL and implement appropriate worker protection. The training and personal respirator protection program requirements apply even if the PEL is not exceeded.

If a job involves the use or removal of lead or lead containing material, the employer must conduct exposure assessments at the beginning of the project to determine worker exposure levels and then to prevent worker overexposure. Monitoring must be conducted on employees believed to be at greatest risk of lead exposure. If any employee is found to be potentially exposed at or above the action level of $30 \mu\text{g}/\text{m}^3$ for at least one day's work, then the results are positive and each employee must have exposure monitoring. OSHA requires that exposure monitoring be conducted for the duration of a full-shift and must represent the employee's regular, daily, and highest exposure to lead. Once the highest risk tasks have been monitored, and results are below the action level, additional monitoring is not required unless conditions change.

- b. Compliance Plan: The OSHA action level is 30 micrograms of lead per cubic meter of air ($\mu\text{g}/\text{m}^3$). If the worker is exposed at or above this level, a personal sampling program must be established. There is also a PEL of $50 \mu\text{g}/\text{m}^3$, which means that

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during an 8-hour work day, a worker may not legally be exposed to more than a time weighted average of 50 µg/m³. If there is potential exposure above the PEL, a written compliance plan must be written. All contractors are responsible for preparing their own plan. This plan must describe in detail the methods of OSHA compliance, including:

- * a description of equipment and materials, controls, crew size, job responsibilities, and operations and maintenance procedures for the activity which involves lead;
- * a description of specific control methods such as wet methods (Wet scraping and wet sanding are acceptable methods of removing deteriorated paint). If engineering controls are used, the description needs to include the rationale for choosing the methods;
- * any technology used to keep exposures below the PEL; and
- * air monitoring data documenting sources of lead emissions and the schedule for inspections.
- * a description of the lead work practice program which will be used to control worker exposures. Controls may include housekeeping, protective clothing and equipment, and hygiene practices;
- * a description of how contractors will inform employees, as well as bystanders, of any potential lead exposures. The individual responsible for control of exposures must also be clarified in the written plan.

An employer needs to establish a respiratory protection program if respirators are used, even if they are used only voluntarily. For additional guidance, refer to OSHA standards in Title 29 Code of Federal Regulation Part 1910.134.

c. OSHA's Three Levels of Monitoring for Exposure

1. **Less than the Action Level (AL):** If exposure

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is below the AL, the employer is responsible to train the employees, conduct periodic exposure monitoring and maintain records of testing. There is no required number of monitoring samples; the frequency of monitoring should be determined by an industrial hygienist or other qualified occupational safety and health professional.

2. **Above the AL but below the Permissible**

Exposure Limit (PEL): If the initial exposure monitoring indicates a level above the AL of 30 $\mu\text{g}/\text{m}^3$ but below the PEL of 50 $\mu\text{g}/\text{m}^3$, additional provisions are required. Exposure monitoring must be performed at least every six months. Although there is no requirement that an employee must use a respirator at levels below the PEL, the employer must provide them if an employee or employees wish to use them (Paper dust masks are not respirators and do not provide adequate protection). Employees must be made aware of possible health effects at blood lead levels below those allowed by OSHA and that they have the right to request respirators even if their PEL is acceptable (Males have been found to have an increase in blood pressure with increasing blood lead levels, even at levels below 10 $\mu\text{g}/\text{dL}$). For airborne concentrations of lead under 500 $\mu\text{g}/\text{m}^3$, the respirator must be at least as effective as a half-mask, air purifying respirator equipped with High Efficiency Particulate Air (HEPA) cartridges or a powered air purifying respirator. Providing employees with respirators necessitates that the employer implement a respiratory protection plan.

Employers must provide initial testing of blood lead levels of workers who are exposed to levels at or above the action level on any single day or who are doing the following tasks:

* manual demolition - clean-up on dry,
abrasive blast
ing
jobs

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- * manual scraping - abrasive blasting enclosure movement/removal
- * manual sanding - abrasive blasting
- * heat gun use - power tool paint removal with HEPA vacuum-assist dust collection system

Employers must also initiate medical surveillance as required in the standard. Initial medical surveillance consists of blood sampling and analysis for lead and zinc protoporphyrin levels. This should be a baseline program for maintenance staff exposed to lead on the job. If an employee has a blood level of 40 µg/dL or more, blood samples must be tested at least every two months until two consecutive tests show levels below 40 µg/dL. If an employee's blood level increases to 50 µg/dL or greater, that employee must be removed from the work site. (**Please note:** it is expected that OSHA will be lowering these levels in the near future). Workers are not penalized for this but should be placed in a lead-free work environment if possible or placed on paid leave.

3. **Exposure above the PEL:** If the initial exposure monitoring indicates a level above the PEL of 50 µg/m³ **or initial exposure monitoring is not yet completed**, additional provisions are required. Exposure monitoring must be conducted at least every 3 months, and employees must use respirators and protective clothing. (Refer to OSHA's lead in construction standard for the proper choice of respirator.)

d. Training - Title X requires that LBP abatement projects be performed by certified persons. As with paint inspections and risk assessments, there will be training and certification requirements for abatement activities. The EPA and HUD have developed a 16 hour training requirement for abatement workers. The training course which will cover operations, maintenance, and interim control activities will be either 8 hours or 16 hours. Any curriculum must cover the risks of lead-based

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paint hazards, unsafe practices, worker protection, and dust clean-up methods.

The following table (TABLE - A) shown on page (111-2) 11 illustrates the different levels of OSHA requirements based on airborne worker exposure to lead dust levels.

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TABLE - A

For Specific Air Lead Levels					During assessment of Trigger Tasks
Regardless of Levels	≥ AL		> PEL	> 4 X PEL	
	1 - 30 Days	> 30 Days			
Exposure assessment & interim protection	Monitoring representative of exposure for each exposed employee	Medical surveillance program	Engineering & work practice controls	Clean protective clothing daily	Appropriate respiratory protection
Housekeeping	Initial medical surveillance	Medical exams & consultation (if required)	Respiratory protection		Protective clothing & equipment
Handwashing facilities	Follow-up blood sampling		Protective clothing & equipment		Change areas
HazCom training (and/or) Safety training & education	Temporary removal if elevated blood lead		Hygiene facilities & practices		Handwashing facilities
	Information & training		Signs		Biological monitoring
					HazCom training
				Respirator training	
				Safety training & education	

111-2.1.6 REMEDIATION

- (A) Interim Controls - The EPA estimates that about 57 million homes in the US contain hazardous levels of LBP and that the average cost for abatement is about \$10,000. Therefore, if the lead in each of these homes were to be abated, the cost to homeowners in the US would be about \$570 billion. It is estimated that IHS owns over 1,200 homes built before 1978, see Appendix E for a partial list of homes. If three-quarters of these have LBP which is abated at \$10,000 per house, the cost to IHS would be over \$9 million. In the late 1980s, EPA recommended the removal of asbestos from buildings to render them safe. Many billions of dollars were spent on asbestos removal, often contaminating the indoor environment to greater levels than had previously existed and causing unnecessary exposures. The lesson learned is that environmental hazards can be controlled without resorting to removal, at less cost and with fewer health risks. Control of environmental hazards while leaving them in place and intact is called an interim control. Interim control means that the solution is not permanent but temporary, and requiring on-going attention. Title X requires the LBP abatement or interim control

projects to be performed by certified individuals.

IHS endorses interim controls of LBP as a cost-effective method for dealing with LBP hazards as manageable risks. Where possible and cost-effective, LBP will be maintained in-place using methods rendering it safe.

The distinction between interim controls and abatement depends upon the degree of work conducted. For instance, interim controls can include replacing a door frame, replacing a room's carpet, cleaning and sealing a room's floor, or even repainting a room. Abatement implies a more comprehensive work project such as replacing all the window sills in a unit, and enclosing the walls of several rooms with gypsum board.

The decision to use interim controls should be based in part on the results of the risk assessment. Some state and local laws may require that a risk assessment be conducted before lead control measures are carried out. If a risk assessment or a paint inspection is not performed, it must be assumed that lead hazards exist on all coated surfaces. The number of years that a structure will continue to be used and the type of use are factors in the decision to use interim controls versus abatement. Structures to be demolished in the near future should receive interim control measures because of the higher cost of full lead abatement.

Interim lead hazard control measures may include:

- (1) Annual observations of painted surfaces unless the paint is known to be free of lead.
- (2) Notification of tenants on procedures for reporting deteriorating paint. The highest priority is housing occupied by children under 6 years old and pregnant women.
- (3) Prompt repair of deteriorated LBP by paint stabilization, enclosure, encapsulation, or removal. In houses with a child under age 6 or a pregnant woman, the lead hazards should be controlled within 30 days after the paint inspection/risk assessment has been made.
- (4) Replacement of carpet in rooms with high lead dust levels.
- (5) Repair of friction or impact surfaces such as windows,

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doors, stairs, and heavy traffic areas of floors, by paint stabilization.

- (6) Removal of door or window trim and reinstallation with painted surface side down. This method is the simplest and cheapest. A bead of caulking along the edges seals any lead dust from escaping.

Cleaning can also be used as an interim control. Conduct monthly lead dust clean-up using a combination of HEPA vacuuming and wet washing with a lead-capturing high-phosphate detergent. HUD recommends a HEPA/wet wash/HEPA procedure to efficiently clean a surface. A suitable detergent contains at least five percent trisodium phosphate (TSP) and can be found in hardware stores. Some states have restricted the use of TSP but it is permitted for limited uses such as lead hazard control. Cleaning is practical only after the source of lead dust is found and controlled.

The CDC advises the use of high phosphate (5 to 8% phosphates) cleanser for automatic dishwashing, as well as for wiping window sills and baseboards. The CDC recommends weekly mopping of hard surface floors in homes built before 1960. Sponges and rags used for lead dust cleaning should not be used for any other purpose, especially for the cleaning of dishes, eating surfaces, and food preparation surfaces. Avoid dry sweeping because it may stir up lead dust and spread it.

If a housing unit has an identified LBP hazard that cannot be promptly controlled within 30 days after paint inspection and the unit is occupied by a child under age six or a pregnant woman, the IHS Service Unit should move the occupants to a comparable unit which does not contain LBP hazards. Before the vacated unit is rented to someone else, any hazards should be controlled and a dust sample taken and tested to ensure compliance. In most units with an identified LBP hazard, the Service Unit may choose to wait until it is vacant to control the hazard, except in case of a health emergency.

- (B) Abatement - A risk assessment or an inspection from a certified person must be conducted before any decision is made to abate LBP. This person must be independent of the abatement contractor to decrease the chance of a conflict of interest.

Any abatement methods must be performed by personnel who are certified as abatement workers. These methods should not be

attempted by untrained personnel.

The method of abatement will depend on the results of the risk assessment or paint inspection and the amount of funding available. A risk assessment may determine that interim controls are not appropriate and abatement is necessary.

The three methods of abatement are as follows:

- (1) Component removal - The simplest and easiest permanent method is component removal. Items such as doors, molding, and window frames can be removed and replaced if they are painted with LBP. Protruding surfaces such as window sills that show signs of chewing should be covered by a permanent covering or replaced.
- (2) Enclosure - Permanent covering of lead paint is accomplished by installing durable construction materials to surfaces such as walls, ceilings, floors, and siding, and sealing the seams and edges to prevent lead dust from escaping. It is relatively inexpensive and must last for at least 20 years.
- (3) Removal - Paint removal is the most hazardous and least desirable method. The only methods recommended for LBP removal are:
 - a. Electrically powered flameless heat guns - May be used to soften the paint which is immediately removed by scraping.
 - b. Wet scraping - The surface is moistened and scraped, a small area at a time, and wet scraping cannot be used near electrical outlets.
 - c. HEPA sanding - Electric sander equipped with a HEPA vacuum filter to reduce the amount of airborne lead dust.
 - d. HEPA vacuum blasting - Abrasive blasting with exhaust air passing through a HEPA filter to be used in exterior work on metal, brick, concrete and masonry surfaces.
 - e. HEPA vacuum needle gun - Needles pound the painted surface to loosen paint which the HEPA vacuum filter captures to be used on metal surfaces.
 - f. Chemical removal - Various chemicals are used to strip paint. Chemical removal is especially dangerous to workers and others who may have access to area. There are many OSHA requirements for safety precautions such as eye wash stations,

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and chemically resistant clothing. A major disadvantage of chemical removal is that lead paint residue is left behind.

Any of these abatement methods requires training and certification. These methods should never be attempted by untrained personnel.

- (C) Encapsulation and Enclosure - Encapsulation is the procedure that covers surfaces with durable materials meant to withstand at least 20 years of use. The materials can be a liquid-applied coating or a material bonded with adhesive to the surface, and sealed or caulked around the edges. This method differs from the enclosure method because it relies on adhesion to the surface, while enclosures are rigid barriers which are bolted or nailed to the surface. Depending on the circumstances, encapsulation or enclosure can be either a form of abatement or interim control.

There are currently no standards on what should be used as an encapsulant or how it should be applied. The success of an encapsulant depends on the bonding between all the existing layers of paint and the adhesion of the encapsulant to the paint's surface. These surfaces which **are not** suitable for encapsulation include friction surfaces (exterior stairs, window and door jambs, exterior wood flooring, etc.), rotten wood, and surfaces with moisture problems or surface deterioration.

Before attempting an encapsulation project, a small patch should be tested in an inconspicuous area to determine if the encapsulation will be successful. A 15 cm² patch area should be prepared and used for coatings in the same way that the final job would be. After the encapsulant has cured, an inspection should be conducted to check for wrinkling, blistering, cracking, or bubbling. Another test consists of cutting an "X" in the patch with a razor or other sharp instrument and attempting to pull the encapsulant away from the surface. If more than a 2 cm² piece is able to be pulled off, the encapsulant is not successful. If the adhesive is removed from the surface or if the paint layers split, this indicates a failure. Documentation of all patch test results must be maintained so that the correct encapsulant or enclosure methods are used for the final work projects.

111-2.1.7 POST ABATEMENT

- A. Cleaning - Lead hazard control work may generate dangerous

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levels of lead dust. It is crucial that workers receive training on the hazards and special problems of cleaning and removing lead dust. Lead dust can be inhaled or ingested, and dangerous levels may be present even on surfaces which appear clean. Therefore, it is very important that thorough cleaning procedures be followed after abatement or interim control.

Workers must be properly protected from exposure to lead dust during cleanup. In addition, workers must be decontaminated before leaving work so their families do not become exposed to lead dust. Nothing used on the job site should leave the job site until it has been laundered, cleaned, or sealed in bags. Disposable supplies should be treated as contaminated debris.

HUD recommends a HEPA/wet wash/HEPA procedure for the most efficient surface cleaning. HEPA vacuums must be used since an ordinary vacuum cleaner is not capable of capturing fine dust and would exhaust it back into the room. The wet wash should be done with a high phosphate detergent containing at least 5% tri-sodium phosphate (TSP). Other cleaning agents have recently been developed which may be safer and more effective. HUD does not prohibit the use of non-TSP cleaners. In fact, the use of any effective alternative cleaners or methods is encouraged.

After the first cleaning, all painted surfaces except floors should be sealed with primer and repainted. The floors should be coated with a sealant to encapsulate any remaining dust. If the floor traffic is high, this should be repeated yearly.

- B. Clearance - Clearance consists of an evaluation to ensure that the work was done properly, that the area is safe for unprotected workers, and residents. Some type of clearance is required for every type of lead-paint hazard control. A certified risk assessor or a certified inspector technician must conduct the clearance evaluation. If the work was completed by IHS workers, a clearance evaluation is still required.

After the hazard abatement and clean-up is completed, a lead dust test (wipe sample) must be performed. According to HUD guidelines, the lead dust level on floors can be no higher than 100 $\mu\text{g}/\text{ft}^2$, on indoor window sills it can be no higher than 500 $\mu\text{g}/\text{ft}^2$, and in window wells (troughs) it can be no higher than 800 $\mu\text{g}/\text{ft}^2$. There should be no visible dust after a clean-up. If any has settled, the cleaning must be

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repeated. These standards must be met before occupancy is allowed. (In the future, the EPA is planning to set more restrictive limits for lead dust based on correlations between environmental lead dust and blood lead levels.) Some blood lead levels have been found which indicate that even a very low amount of lead dust can contribute to a border-line blood lead level. The current HUD guidelines are based on achievability.

If abatement or interim controls were performed on exterior painted surfaces, a soil sample should be taken. The clearance level should be less than 2,000 μg of lead per gram (g) of soil. If the area is a play area, it should be less than 400 $\mu\text{g/g}$. Additionally, there should be no visible paint chips on the ground. If there are any paint chips, they should be considered as part of the soil and gathered with the soil sample.

- C. Maintaining Surfaces Where LBP Has Not Been Removed - Aside from the routine cleaning which must be conducted to control lead dust from becoming a hazard, interim controls require annual visual surveys, reevaluations, and repair when necessary.

Facility management personnel should conduct a visual survey of interim controls at least once a year to ensure that the hazard controls are still intact. A visual inspection should also be conducted if a resident has a concern about lead hazards, the property becomes vacant or a new resident moves in, or any damage such as fire, vandalism or flooding occurs. Action should be taken on the following conditions:

- (1) exterior painted surfaces with more than 1 meter (m)² of deterioration,
- (2) interior painted surfaces with more than 0.2 m² of deterioration (7 in²)
- (3) small surfaces (exterior and interior) with more than 10% deterioration

Corrective action is necessary to prevent deterioration of surfaces. Failure to act may cause the problem to worsen and the increase costs. Abatement enclosures should be checked at least every year or whenever water or other damage is reported. Encapsulants should be checked after the first 6 months and at least annually thereafter to ensure that they maintain their integrity.

An annual reevaluation risk assessment must be conducted by a certified risk assessor and should include dust sampling

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to identify any new lead-based paint hazards. Refer to the HUD recommended schedule of reevaluations in the Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Chapter 6, Table 6.1.

If high levels of lead dust were found during the assessment, in the soil, ground cover such as bark, gravel, concrete, or sod should be used to cover the area. Ground cover should be checked at three months and annually thereafter to identify any bare spots.

Records should also be maintained which document where the interim controls were performed, the concentration of lead underneath the encapsulant or enclosure, schedule of monitoring and repairs, names of products used, contractor names and addresses, and completion dates.

111-2.1.8 WASTE DISPOSAL

The Federal statute covering waste management is the Resource Conservation and Recovery Act (RCRA). Many states and some tribes administer the RCRA hazardous waste program, therefore any facility must ensure that they meet Federal as well as state and local regulations. Some state and local hazardous waste requirements are more strict than the Federal requirements.

RCRA classifies waste containing LBP in two ways depending on if it is produced by the home occupant as routine maintenance waste or waste generated by the government or a contractor. Waste from routine maintenance performed by the home occupant is exempt from RCRA hazardous waste regulations and may be disposed as general refuse. Other waste must be evaluated to see if it is hazardous as defined by RCRA.

It is important to note that if a renovation or abatement produces less than 100 kg of hazardous waste per month (about 220 pounds per month or 25 gallons of liquid), this quantity is categorized as "conditionally exempt, small-quantity" under RCRA. Conditionally exempt waste does not require a manifest prior to shipment to a hazardous waste site. Some states administering RCRA may have more restrictive definitions of exempt small. The state should be contacted to verify local requirements.

If the waste originates from abatement work, RCRA classifies it under four different categories depending on the quantity of waste and the amount of lead it contains. The generator is responsible for determining the appropriate category. The state should be contacted for assistance in determining how to manage lead wastes since each state has enforcement authority for waste

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disposal.

- A. **Category I** is for low lead waste which may consist of filtered wash water, disposable personal protective clothing (HEPA vacuumed before disposal), plastic sheeting (wet wiped before disposal), carpeting, and nonhazardous waste. It has concentrations of leachable lead below 5 ppm. Wash water may be disposed of in the toilet if approved by the local authority. Do not dump wash water on the ground. Category I solid waste should be disposed of in accordance with state and local solid waste requirements.
- B. **Category II** is for architectural components and consists of any carpentry or building materials such as painted doors, window sills, trim, baseboards, stone, brick, radiators, or walls. This category does not include the paint chips which may fall off the components, or lead sheeting. The generator is required to evaluate this waste for any potential hazardous waste under RCRA before disposal. A lab should be located that can conduct the Toxicity Characteristic Leaching Procedure (TCLP), a test that measures the amount of lead which could leach from a sample into groundwater. The allowable limit for lead is 5 ppm. As a substitute for the TCLP test, generators are also allowed to use their knowledge of the waste to identify it as nonhazardous. The RCRA hotline is 1(800)424-9346 and can answer questions about analysis of waste.
- C. **Category III** is for concentrated lead waste and includes paint strippings, lead paint chips and dust, HEPA vacuum debris and filter, and any other hazardous waste. The lead content of these wastes is usually above 5 ppm and should be considered hazardous waste unless the generator has negative TCLP test results. Test results should be kept for at least 10 years as legal protection.
- D. **Category IV** is for other waste such as lead-contaminated soil. It should be tested to determine if it hazardous under RCRA unless the generator has knowledge that it is not. If it is hazardous, it should be handled as Category III waste; if not hazardous, it should be handled as Category I waste.

Hazardous waste which is generated at more than 100 kg per month should be managed under RCRA hazardous waste requirements. This includes obtaining an EPA identification number before shipping offsite, meeting standards for storage and training, writing a waste minimization plan, properly packing and placarding the waste when transporting,

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selecting an EPA permitted hazardous waste transporter and management facility, and maintaining records of biennial reports, reports of manifests which were not returned, and all manifests, test results, and land-disposal certifications.

Hazardous waste which is generated at less than 100 kg per month should be, at a minimum, disposed of in state-licensed or permitted hazardous waste disposal facility. To maintain their "conditionally exempt, small-quantity generator" status, generators are not allowed to store more than 1000 kg (about 2,200 pounds) of hazardous waste onsite at any one time.

Non-hazardous waste should be managed in accordance with Federal and state regulations and HUD recommendations. According to HUD recommendations, categories II and III waste should be wrapped and taped in 6-mil plastic for storage and transport to a disposal facility. The wastes should be covered during transport and should not be incinerated or recycled for mulch. Only nonhazardous waste should be disposed of in landfills.

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APPENDIX A - RESOURCES

The U.S. Department of Housing and Urban Development (HUD) published an in-depth and comprehensive Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing. The Guidelines are available for a small fee from HUD by calling 1(800)245-2691. The Guidelines will be revised as new information becomes available.

Additional questions and/or information may be answered by contacting the following sources of public information:

- A. HUD Office of Lead-Based Paint Abatement and Poisoning Prevention
1(800)743-5232
- B. EPA Lead Information Hotline 1(800)LEAD-FYI
The Hotline also provides many materials, including Lead Poisoning and Your Children.
- C. National Lead Information Center Clearinghouse, operated by the National Safety Council 1(800)424-LEAD. They provide a list of laboratories that can analyze paint and dust samples for lead. The Clearinghouse also answers specific questions over the phone and provides single copies of information pamphlets. For technical information, call: Doreen Cantor, Environmental Protection Agency, Office of Pollution Prevention and Toxics, 1(202)260-1777, FAX 1(202)160-0770; or Ken Giles, Consumer Product Safety Commission, 1(301)504-0580, FAX 1(301)504-0862.
- D. Government Printing Office 1(202)512-1800. GPO will send multiple copies of the information pamphlet Protecting Your Family From Lead In Your Home, GPO stock number 055-000-00507-9, with a fee of \$26.00 for 50 copies. Copies may also be downloaded from the internet at <http://www.epa.gov.opptintr/lead>.
- E. National Conference of State Legislatures 1(303)830-2200. They provide information about the current state regulations for disposing of lead waste.
- F. Occupational Safety and Health Administration (OSHA), Department of Job Safety and Health 1(202)219-8151. They provide information on respirators and protective clothing for safely doing renovations, among other things.
- G. Toxic Substances Control Act (TSCA) Hotline 1(202)554-0551,

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for
general information on lead poisoning prevention.

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APPENDIX B - DEFINITIONS and ABBREVIATIONS

- A. **Abatement** - Any measure or set of measures designed to permanently eliminate lead-based paint hazards or lead-based paint. Abatement includes but is not limited to:
- (1) The removal of lead-based paint and lead-contaminated dust, the permanent enclosure or encapsulation of lead-based paint, the replacement of lead-painted surfaces or fixtures, and the removal or covering of lead-contaminated soil; and
 - (2) All preparation, cleanup, disposal, and post-abatement clearance testing activities associated with such measures.
 - (3) Specifically, abatement includes, but is not limited to:
 - a. Projects for which there is a written contract or other documentation, which provides that an individual or firm will be conducting activities in or to a residential dwelling or child-occupied facility that:
 1. Shall result in the permanent elimination of lead-based paint hazards; or
 2. Are designed to permanently eliminate lead-based paint hazards and are described in paragraphs (1) and (2).
 - b. Projects resulting in the permanent elimination of lead-based paint hazards, conducted by firms or individuals certified in accordance with Sec. 745.226, unless such projects are covered by paragraph (4) of this definition;
 - c. Projects resulting in the permanent elimination of lead-based paint hazards, conducted by firms or individuals who, through their company name or promotional literature, represent, advertise, or hold themselves out to be in the business of performing lead-based paint activities as identified and defined by this section, unless such projects are covered by paragraph (4) of this definition; or
 - d. Projects resulting in the permanent elimination of lead-based paint hazards, that are conducted in response to state or local abatement orders.
 - (4) Abatement does not include renovation, remodeling, landscaping or other activities, when such activities are not designed to permanently eliminate lead-based paint hazards, but, instead, are designed to repair, restore, or remodel a given structure or dwelling, even though these activities may incidentally result in a reduction or elimination of lead-based paint hazards. Furthermore, abatement does not include interim

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controls, operations and maintenance activities, or other measures and activities designed to temporarily, but not permanently, reduce lead-based paint hazards.

- B. **Action Level** - A level of exposure set by OSHA which more action needs to be taken to protect workers' health. Lead's action level is a 30 $\mu\text{g}/\text{m}^3$ average for an 8-hour shift. If an employee may be exposed to this level, additional provisions such as blood lead testing and exposure monitoring at least every 6 months are required.
- C. **Blood lead threshold** - The lead content in a person's blood. A blood lead level greater than or equal to 10 $\mu\text{g}/\text{dL}$ is defined as hazardous to children by the Centers for Disease Control and Prevention. OSHA defines 50 $\mu\text{g}/\text{dL}$ as the blood lead level at which workers are removed from exposure.
- D. **Chalking** - The photo-oxidation of paint binders usually due to weathering that causes a powder to form on the film surface.
- E. **Child-occupied facility** - A building, or portion of a building, constructed prior to 1978, visited regularly by the same child, 6 years of age or under, on at least two different days within any week (Sunday through Saturday period), provided that each day's visit lasts at least 3 hours and the combined weekly visit lasts at least 6 hours, and the combined annual visits last at least 60 hours. Child-occupied facilities may include, but are not limited to, day-care centers, preschools and kindergarten classrooms.
- F. **Cleaning** - The process of using a HEPA vacuum and wet cleaning agents to remove leaded dust; the process includes the removal of bulk debris from the work area. OSHA prohibits the use of compressed air to clean lead-contaminated dust from a surface.
- G. **Clearance examination** - Visual examination and collection of environmental samples by an inspector or risk assessor and analysis by an accredited laboratory upon completion of an abatement project, interim control intervention, or maintenance job that disturbs lead-based paint (or paint suspected of being lead-based). The clearance examination is done to ensure that lead exposure levels do not exceed standards established by the EPA Administrator pursuant to Title IV of the Toxic Substance Control Act (These standards have not been set yet). Cleaning following the work described above must meet those standards.

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- H. **Deciliter (dL)** - A deciliter is one tenth of a liter.
- I. **Deteriorated lead-based paint** - Any lead-based paint coating on a damaged or deteriorated surface or fixture, or any interior or exterior lead-based paint that is peeling, chipping, blistering, flaking, worn, chalking, alligatoring, cracking, or otherwise becoming separated from the substrate.
- J. **Elevated Blood Lead level (EBL) child** - A child who has a blood lead level greater than or equal to 20 µg/dL.
- K. **Encapsulation** - Any covering or coating that acts as a barrier between lead-based paint and the environment. The durability of encapsulation relies on adhesion and the integrity of the existing bonds between multiple layers of paint and between the paint and the substrate.
- L. **HEPA filter** - A High Efficiency Particulate Air Filter capable of removing particles of 0.3 microns or larger from air with at least 99.97 percent efficiency.
- M. **Inspection: see Paint Inspection**
- N. **Interim controls** - A set of measure designed to temporarily reduce human exposure or likely exposure to lead-based paint hazards. Interim controls could include specialized cleaning to reduce lead-contaminated dust, repairs, maintenance, painting, temporary containment, ongoing monitoring of lead-based paint hazards or potential hazards, and the establishment and operation of management and resident education programs.
- O. **Investigation** - The process of determining the source of lead exposure for a child or other resident with an elevated blood lead level. An investigation includes at least a questionnaire, environmental sampling, and case management.
- P. **Lead-based paint** - Any paint, varnish, shellac or any other coating that contains lead with a concentration of at least 1.0 mg per cm² (as measured by laboratory analysis or XRF), or with at least 0.5 percent lead by weight or 5000 ppm (as measured by laboratory analysis).
- Q. **Lead-contaminated dust** - HUD recommends that indoor surface dust contain no more than 1080 µg/m² on floors, 5380 µg/m² on interior window sills, and 8610 µg/m² on window troughs. EPA is expected to set more stringent standards based on health as part of Title IV of the Toxic Substances Control

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Act.

- R. **Lead-poisoned child** - A child with a single blood lead level that is greater or equal than 20 µg per deciliter (dL).
- S. **Paint Inspection** - Surface by surface investigation of all painted surfaces, interior and exterior, using portable x-ray fluorescence (XRF) analyzers and/or laboratory analysis of paint samples to determine the presence of lead-based paint, and the provision of a report on the result. This only provides the lead content of painted surfaces, not whether the paint is a hazard or how you should deal with it. This can be combined with the risk assessment.
- T. **Permissible Exposure Limit (PEL)** - A time-weighted exposure limit set by OSHA which a worker may not legally exceed. Lead's PEL is 50 µg/m³ during an 8-hour shift. If exposures are higher than this a written compliance plan must be written, appropriate respirators and protective clothing must be worn, blood monitoring and frequent exposure monitoring must be conducted, and housekeeping, hygiene and handwashing must be enforced.
- U. **Risk assessment** - An on-site investigation to discover any lead-based paint hazards. Risk assessments include visual inspection, limited environmental samplings of dust, soil, and deteriorated paint. A report of the results identifies acceptable actions for controlling any lead-based paint hazards identified. Have a qualified risk assessor conduct this assessment. Risk assessments and paint inspections can be combined.
- V. **Target housing** - Any housing constructed before 1978 with exception; dwellings that do not contain bedrooms, or dwellings developed specifically for the elderly or the disabled (unless a child under 6 years resides or is expected to reside in the dwelling).
- W. **Treatment** - Any method used to control lead-based paint hazards. This may include interim controls, abatement, and removal.
- X. **Microgram (µg)** - A microgram is one one-millionth of a gram.
- Y. **X-Ray Fluorescence (XRF) Analyzer** - An instrument that measures lead concentration in milligrams per square centimeter using x-ray fluorescence.

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APPENDIX C - SAMPLE DISCLOSURE FORMAT

NOT INCLUDED IN THIS ISSUE.

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APPENDIX D - PROTECT YOUR FAMILY FROM LEAD IN YOUR HOME
AN EPA PUBLICATION

- A. PROTECT YOUR FAMILY FROM LEAD IN YOUR HOME - Simple Steps To Protect Your Family From Lead Hazards, if you think your home has high levels of lead:
- * Get your young children tested for lead, even if they seem healthy.
 - * Wash children's hands, bottles, pacifiers, and toys often.
 - * Make sure children eat healthy, low-fat foods.
 - * Get your home checked for lead hazards.
 - * Regularly clean floors, window sills, and other surfaces.
 - * Wipe soil off shoes before entering house.
 - * Talk to your landlord about fixing surfaces with peeling or chipping paint.
 - * Take precautions to avoid exposure to lead dust when remodeling or renovating (call 1-800-424-LEAD for guidelines).
 - * Don't use a belt-sander, propane torch, dry scraper, or dry sandpaper on painted surfaces that may contain lead.
 - * Don't try to remove lead-based paint yourself.
- B. ARE YOU PLANNING TO BUY, RENT, OR RENOVATE A HOME BUILT BEFORE 1978? - Many houses and apartments built before 1978 have paint that contains lead (called lead-based paint). Lead from paint, chips, and dust can pose serious health hazards if not taken care of properly. By 1996, federal law will require that individuals receive certain information before renting, buying, or renovating pre-1978 housing:
- (1) LANDLORDS will have to disclose known information on lead-based paint hazards before leases take effect. Leases will include a federal form about lead-based paint.
 - (2) SELLERS will have to disclose known information on lead-based paint hazards before selling a house. Sales contracts will include a federal form about lead-based paint in the building. Buyers will have up to 10 days to check for lead hazards.
 - (3) RENOVATORS will have to give you this pamphlet before starting work.
 - (4) If you want more information on these requirements, call the National Lead Information Clearinghouse at 1-800-424-LEAD.
- C. This document is in the public domain. It may be reproduced by an individual or organization without permission. Information provided in this booklet is based upon current scientific and technical understanding of the issues presented and is reflective of the jurisdictional boundaries established by the statutes governing the co-authoring agencies. Following the advice given will not necessarily provide complete protection in all situations or against all health hazards that can be caused by lead exposure.
- (1) IMPORTANT - Lead From Paint, Dust, and Soil Can Be Dangerous If Not Managed properly.

FACT: Lead exposure can harm young children and babies even before they are born.
FACT: Even children that seem healthy can have high levels of lead in their bodies.
FACT: People can get lead in their bodies by breathing or swallowing lead dust, or by eating soil or paint chips with lead in them.

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FACT: People have many options for reducing lead hazards. In most cases, lead-based paint that is in good condition is not a hazard. FACT: Removing lead-based paint improperly can increase the danger to your family.

- (2) If you think your home might have lead hazards, read this pamphlet to learn some simple steps to protect your family.

(3) LEAD GETS IN THE BODY IN MANY WAYS

- * 1 out of every 11 children in the United States has dangerous levels of lead in the bloodstream.
- * Even children who appear healthy can have dangerous levels of lead.
- * People can get lead in their body if they:
 - * Put their hands or other objects covered with lead dust in their mouths.
 - * Eat paint chips or soil that contain lead.
 - * Breathe in lead dust (especially during renovations that disturb painted surfaces).
- * Lead is even more dangerous to children than adults because:
 - * Babies and young children often put their hands and other objects in their mouths. These objects can have lead dust on them.
 - * Children's growing bodies absorb more lead.
 - * Children's brains and nervous systems are more sensitive to the damaging effects of lead.

(4) Lead's Effects

- * If not detected early, children with high levels of lead in their bodies can suffer from:
 - * Damage to the brain and nervous system
 - * Behavior and learning problems (such as hyperactivity)
 - * Slowed growth
 - * Hearing problems
 - * Headaches
- * Lead is also harmful to adults. Adults can suffer from:
 - * Difficulties during pregnancy
 - * Other reproductive problems (in both men and women)
 - * High blood pressure
 - * Digestive problems
 - * Nerve disorders
 - * Memory and concentration problems
 - * Muscle and joint pain
- * Lead affects the body in many ways.

(5) CHECKING YOUR FAMILY FOR LEAD

- * Get your children tested if you think your home has high levels of lead. A simple blood test can detect high levels of lead. Blood tests are important for:
 - * Children who are 6 months to 1 year old (6 months if you live in an older home that might have lead in the paint).
 - * Family members that you think might have high levels of lead.
 - * If your child is older than 1 year, talk to your doctor about whether your child needs testing.
- * Your doctor or health center can do blood tests. They are inexpensive and sometimes free. Your doctor will explain what the

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test results mean. Treatment can range from changes in your diet to medication or a hospital stay.

(6) WHERE LEAD-BASED PAINT IS FOUND

- * In general, the older your home, the more likely it has lead-based paint.

- * Many homes built before 1978 have lead-based paint. In 1978, the federal government banned lead-based paint from housing. Lead can be found:

- * In homes in the city, country, or suburbs.
 - * In apartments, single-family homes, and both private and public housing.
 - * Inside and outside of the house.
 - * In soil around a home. (Soil can pick up lead from exterior paint, or other sources such as past use of leaded gas in cars.)

(7) WHERE LEAD IS LIKELY TO BE A HAZARD

- * Lead from paint chips, which you can see, and lead dust, which you can't always see, can both be serious hazards.

- * Lead-based paint that is in good condition is usually not a hazard.

- * Peeling, chipping, chalking, or cracking lead-based paint is a hazard and needs immediate attention.

- * Lead-based paint may also be a hazard when found on surfaces that children can chew or that get a lot of wear-and-tear. These areas include:

- * Windows and window sills.
 - * Doors and door frames.
 - * Stairs, railings, and banisters.
 - * Porches and fences.

- * Lead dust can form when lead-based paint is dry scraped, dry sanded, or heated. Dust also forms when painted surfaces bump or rub together. Lead chips and dust can get on surfaces and objects that people touch. Settled lead dust can reenter the air when people vacuum, sweep, or walk through it.

- * Lead in soil can be a hazard when children play in bare soil or when people bring soil into the house on their shoes. Call your state agency (see below) to find out about soil testing for lead.

(8) CHECKING YOUR HOME FOR LEAD HAZARDS

- * Just knowing that a home has lead-based paint may not tell you if there is a hazard.

- * You can get your home checked for lead hazards in one of two ways, or both:

- * A paint inspection tells you the lead content of every painted surface in your home. It won't tell you whether the paint is a hazard or how you should deal with it.

- * A risk assessment tells you if there are any sources of serious lead exposure (such as peeling paint and lead dust). It also tells you what actions to take to address these hazards.

- * Have qualified professionals do the work. The federal government is writing standards for inspectors and risk assessors. Some states might already have standards in place. Call your state agency for help with locating qualified professionals in

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your area (see below). Trained professionals use a range of methods when checking your home, including:

- * Visual inspection of paint condition and location.
- * Lab tests of paint samples.
- * Surface dust tests.
- * A portable x-ray fluorescence machine.

* Home test kits for lead are available, but the federal government is still testing their reliability. These tests should not be the only method used before doing renovations or to assure safety.

- (9) WHAT YOU CAN DO NOW TO PROTECT YOUR FAMILY? If you suspect that your house has lead hazards, you can take some immediate steps to reduce your family's risk:

- * If you rent, notify your landlord of peeling or chipping paint.
- * Clean up paint chips immediately.

* Clean floors, window frames, window sills, and other surfaces weekly. Use a mop or sponge with warm water and a general all-purpose cleaner or a cleaner made specifically for lead.

REMEMBER: NEVER MIX AMMONIA AND BLEACH PRODUCTS TOGETHER SINCE THEY CAN FORM A DANGEROUS GAS.

- * Thoroughly rinse sponges and mop heads after cleaning dirty or dusty areas.

* Wash children's hands often, especially before they eat and before nap time and bed time.

* Keep play areas clean. Wash bottles, pacifiers, toys, and stuffed animals regularly.

* Keep children from chewing window sills or other painted surfaces.

* Clean or remove shoes before entering your home to avoid tracking in lead from soil.

* Make sure children eat nutritious, low-fat meals high in iron and calcium, such as spinach and low-fat dairy products. Children with good diets absorb less lead.

- (10) HOW TO SIGNIFICANTLY REDUCE LEAD HAZARDS

* Removing lead improperly can increase the hazard to your family by spreading even more lead dust around the house.

* Always use a professional who is trained to remove lead hazards safely.

* In addition to day-to-day cleaning and good nutrition:

- * You can temporarily reduce lead hazards by taking actions like repairing damaged painted surfaces and planting grass to cover soil with high lead levels. These actions (called "interim controls") are not permanent solutions and will not eliminate all risks of exposure.

- * To permanently remove lead hazards, you must hire a lead "abatement" contractor. Abatement (or permanent hazard elimination) methods include removing, sealing, or enclosing lead-based paint with special materials. Just painting over the hazard with regular paint is not enough.

- * Always hire a person with special training for correcting lead problems--someone who knows how to do this work safely and has the proper equipment to clean up thoroughly. If possible, hire a certified lead abatement contractor. Certified contractors will employ qualified workers and follow strict safety rules as set by their state or by the federal government.

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* Call your state agency (see below) for help with locating qualified contractors in your area and to see if financial assistance is available.

(11) REMODELING OR RENOVATING A HOME WITH LEAD-BASED PAINT

* If not conducted properly, certain types of renovations can release lead from paint and dust into the air.

* Take precautions before you begin remodeling or renovations that disturb painted surfaces (such as scraping off paint or tearing out walls):

* Have the area tested for lead-based paint.

* Do not use a dry scraper, belt-sander, propane torch, or heat gun to remove lead-based paint. These actions create large amounts of lead dust and fumes. Lead dust can remain in your home long after the work is done.

* Temporarily move your family (especially children and pregnant women) out of the apartment or house until the work is done and the area is properly cleaned. If you can't move your family, at least completely seal off the work area.

* Follow other safety measures to reduce lead hazards. You can find out about other safety measures by calling 1(800)424-LEAD. Ask for the brochure "Reducing Lead Hazards When Remodeling Your Home." This brochure explains what to do before, during, and after renovations.

* If you have already completed renovations or remodeling that could have released lead-based paint or dust, get your young children tested and follow the steps outlined above in this brochure.

(12) OTHER SOURCES OF LEAD

* While paint, dust, and soil are the most common lead hazards, other lead sources also exist.

* Drinking water. Your home might have plumbing with lead or lead solder. Call your local health department or water supplier to find out about testing your water. You cannot see, smell, or taste lead, and boiling your water will not get rid of lead. If you think your plumbing might have lead in it:

* Use only cold water for drinking and cooking.

* Run water for 15 to 30 seconds before drinking it, especially if you have not used your water for a few hours.

* The job. If you work with lead, you could bring it home on your hands or clothes. Shower and change clothes before coming home. Launder your clothes separately from the rest of your family's.

* Old painted toys and furniture.

* Food and liquids stored in lead crystal or lead-glazed pottery or porcelain.

* Lead smelters or other industries that release lead into the air.

* Hobbies that use lead, such as making pottery or stained glass, or refinishing furniture.

* Folk remedies that contain lead, such as "greta" and "azarcon" used to treat an upset stomach.

(13) FOR MORE INFORMATION

* The National Lead Information Center, Call 1(800) LEAD-FYI to learn how to protect children from lead poisoning.

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* For other information on lead hazards, call the center's clearinghouse at 1(800)424-LEAD. For the hearing impaired, call TDD 1(800)526-5456 (FAX: 202-659-1192, Internet: EHC@CAIS.COM).
* EPA's Safe Drinking Water Hotline, Call 1(800)426-4791 for information about lead in drinking water.
* Consumer Product Safety Commission Hotline
* To request information on lead in consumer products, or to report an unsafe consumer product or a product-related injury call 1(800)638-2772. (Internet: info@cpsc.gov). For the hearing impaired, call TDD 1(800)638-8270.

(14) STATE HEALTH AND ENVIRONMENTAL AGENCIES

* Some cities and states have their own rules for lead-based paint activities. Check with your state agency (listed below) to see if state or local laws apply to you. Most state agencies can also provide information on finding a lead abatement firm in your area, and on possible sources of financial aid for reducing lead hazards.

State/Region	Phone Number
Alabama	(205) 242-5661
Alaska	(907) 465-5152
Arkansas	(501) 661-2534
Arizona	(602) 542-7307
California	(510) 450-2424
Colorado	(303) 692-3012
Connecticut	(203) 566-5808
Washington, DC	(202) 727-9850
Delaware	(302) 739-4735
Florida	(904) 488-3385
Georgia	(404) 657-6514
Hawaii	(808) 832-5860
Idaho	(208) 332-5544
Illinois	(800) 545-2200
Indiana	(317) 382-6662
Iowa	(800) 972-2026
Kansas	(913) 296-0189
Kentucky	(502) 564-2154
Louisiana	(504) 765-0219
Massachusetts	(800) 532-9571
Maryland	(410) 631-3859
Maine	(207) 287-4311
Michigan	(517) 335-8885
Minnesota	(612) 627-5498
Mississippi	(601) 960-7463
Missouri	(314) 526-4911
Montana	(406) 444-3671
Nebraska	(402) 471-2451
Nevada	(702) 687-6615
New Hampshire	(603) 271-4507
New Jersey	(609) 633-2043
New Mexico	(505) 841-8024
New York	(800) 458-1158
North Carolina	(919) 715-3293
North Dakota	(701) 328-5188
Ohio	(614) 466-1450
Oklahoma	(405) 271-5220
Oregon	(503) 248-5240
Pennsylvania	(717) 782-2884

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Rhode Island (401) 277-3424
South Carolina (803) 935-7945
South Dakota (605) 773-3153
Tennessee (615) 741-5683
Texas (512) 834-6600
Utah (801) 536-4000
Vermont (802) 863-7231
Virginia (800) 523-4019
Washington (206) 753-2556
West Virginia (304) 558-2981
Wisconsin (608) 266-5885
Wyoming (307) 777-7391

(15) EPA REGIONAL OFFICES

* Your Regional EPA Office can provide further information regarding regulations and lead protection programs.

* EPA Regional Offices

Region 1 (Connecticut, Massachusetts, Maine, New Hampshire, Rhode Island, Vermont)
John F. Kennedy Federal Building
One Congress Street
Boston, MA 02203 Tel. No. (617) 565-3420

Region 2 (New Jersey, New York, Puerto Rico, Virgin Islands)
Building 5
2890 Woodbridge Avenue
Edison, NJ 08837-3679 Tel. No. (908) 321-6671

Region 3 (Delaware, Washington DC, Maryland, Pennsylvania, Virginia, West Virginia)
841 Chestnut Building
Philadelphia, PA 19107 Tel. No. (215) 597-9800

Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee)
345 Courtland Street, NE
Atlanta, GA 30365 Tel. No. (404) 347-4727

Region 5 (Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin)
77 West Jackson Boulevard
Chicago, IL 60604-3590 Tel. No. (312) 886-6003

Region 6 (Arkansas, Louisiana, New Mexico, Oklahoma, Texas)
First Interstate Bank Tower
1445 Ross Avenue, 12th Floor, Suite 1200
Dallas, TX 75202-2733 Tel. No. (214) 665-7244

Region 7 (Iowa, Kansas, Missouri, Nebraska)
726 Minnesota Avenue
Kansas City, KS 66101 Tel. No. (913) 551-7020

Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming)
999 18th Street, Suite 500
Denver, CO 80202-2405 Tel. No. (303) 293-1603

Region 9 (Arizona, California, Hawaii, Nevada)

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75 Hawthorne Street
San Francisco, CA 94105 Tel. No. (415) 744-1124

Region 10 (Idaho, Oregon, Washington, Alaska)
1200 Sixth Avenue
Seattle, WA 98101 Tel. No. (206) 553-1200

(16) CPSC REGIONAL OFFICES

Eastern Regional Center
6 World Trade Center
Vesey Street, Room 350
New York, NY 10048 Tel. No. (212) 466-1612

Central Regional Center
230 South Dearborn Street, Room 2944
Chicago, IL 60604-1601 Tel. No. (312) 353-8260

Western Regional Center
600 Harrison Street, Room 245
San Francisco, CA 94107 Tel. No. (415) 744-2966

APPENDIX E - IHS HOUSES

Partial listing of IHS houses built prior to 1960, and between

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1960 and 1978:

IHS Area and Community	Built prior to 1960	Built between 1960 & 1978
ABERDEEN		
Belcourt, ND	4	29
Eagel Butte, SD	0	32
Ft. Totten, ND	1	0
McLaughlin, ND	0	4
New Town, ND	1	0
Pine Ridge, SD	17	43
Rapid City, SD	4	0
Rosebud, SD	7	26
Sisseton, SD	0	2
Wagner, SD	1	1
Wanblee, SD	0	5
Winnebago, NE	4	9
ALBUQUERQUE		
Dulce, NM	0	1
Mescalero, NM	0	14
Zuni, NM	2	13
ALASKA		
Barrow, AK	0	13
Kanakanak, AK	8	12
Kotzebue, AK	0	9
Mt. Edgecumbe, AK	3	10
Nome, AK	1	0

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IHS Area and Community	Built prior to 1960	Built between 1960 & 1978
BEMIDJI		
Cass Lake, MN	0	1
White Earth, MN	2	0
BILLINGS		
Browning, MT	5	30
Crow, MT	1	30
Washakie, WY	0	9
Harlem, MT	4	12
Lame Deer, MT	1	5
Poplar, MT	7	11
Rocky Boy, MT	0	2
NASHVILLE		
Philadelphia, MS	0	3
Cherokee, NC	2	4
NAVAJO		
Chinle, AZ	0	19
Crownpoint, NM	2	53
Ft. Defiance, AZ	9	61
Gallup, NM	0	13
Kayenta, AZ	0	24
Shiprock, NM	5	54
Shonto, AZ	0	3
Tuba City, AZ	2	59

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IHS Area and Community	Built prior to 1960	Built between 1960 & 1978
Window Rock, AZ	7	12
OKLAHOMA		
Talihina, OK	11	0
PHOENIX		
Keams Canyon, AZ	0	43
Owyhee, NV	5	10
Parker, AZ	2	10
Peach Springs, AZ	0	5
Sacaton, AZ	2	6
San Carlos, AZ	0	35
Shurz, AZ	0	10
Supai, AZ	0	1
White River, AZ	0	28
PORTLAND		
Neah Bay, WA	?	?
Warm Springs, OR	2	5
TUCSON		
Sells, AZ	0	53
TOTAL	122	861

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APPENDIX F - EPA REGIONAL OFFICES

EPA HQ (703) 412-9810
Hotline 1(800)424-9346

Region I State Waste Programs JFK Federal Building Boston, MA 02203 (617) 565 3258 Serves CT, MA, ME, NH, RI, VT	Region VI Air and Hazardous Materials Division 1201 El Street Dallas, TX 75270 (214) 665-6444 Serves AR, LA, NM, OK, TX
Region II Air and Waste Management Division 26 Federal Plaza New York, NY 10278 (212) 637-4127 Serves NJ, NY, PR, VI	Region VII RCRA Branch 726 Minnesota Ave. Kansas City, KS 66101 (913) 551-7020 Serves IA, KS, MO, NE
Region III Waste Management Branch 841 Chestnut Street Philadelphia, PA 19107 (215) 566-2617 Serves DE, MD, VA, WV	Region VIII Waste Management Division 999 18th Street, Suite 1300 Denver, CO 80202-2413 (303) 312-6776 Serves CO, MT, ND, SD, UT, WY
Region IV Hazardous Waste Management Division 345 Courtland Street, NE Atlanta, GA 30365 (404) 347-3454 Serves AL, FL, GA, KY, MS, NC, SC, TN	Region IX Toxic and Waste Management Division 215 Fremont Street San Francisco, CA 94105 (415) 744-1730 Serves AZ, CA, HI, NV, Samoa, Guam, Pacific Isles
Region V RCRA Activities 230 South Dearborne Street Chicago, IL 60604 (312) 886-7345 Serves IL, IN, MI, MN, OH, WI	Region X Waste Management Branch 1200 Sixth Ave Seattle, WA 98101 (206) 553-1061 Serves AK, ID, OR, WA

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APPENDIX G - TRAINING REQUIREMENTS

A. Training Program Requirements - Training programs shall meet the following:

- (1) The **inspector** course shall have a minimum of 24 training hr, with a minimum of 8 hr devoted to hands-on training activities.
- (2) The **risk assessor** course shall have a minimum of 16 training hr, with a minimum of 4 hr devoted to hands-on training activities.
- (3) The **supervisor** course shall have a minimum of 32 training hr, with a minimum of 8 hr devoted to hands-on activities.
- (4) The **project designer** course shall have a minimum of 8 training hr.
- (5) The **abatement worker** course shall have a minimum of 16 training hr, with a minimum of 8 hr devoted to hands-on training activities.

For each course offered, the training program shall conduct either a course test at the completion of the course, and if applicable, a hands-on skills assessment.

B. Minimum training curriculum requirements - To become accredited to offer lead-based paint courses instruction in the specific disciplines listed below, training programs must ensure that their courses of study include, at a minimum, the following course topics. Requirements ending in an asterisk (*) indicate areas that require hands-on activities as an integral component of the course.

- (1) **Inspector**
 - a. Role and responsibilities of an inspector.
 - b. Background information on lead and its adverse health effects.
 - c. Background information on Federal, state, and local regulations and guidance that pertains to lead-based paint and lead-based paint activities.
 - d. Lead-based paint inspection methods, including selection of rooms and components for sampling or testing.
 - e. Paint, dust, and soil sampling methodologies.
 - f. Clearance standards and testing, including random sampling.
 - g. Preparation of the final inspection report.
 - h. Recordkeeping.

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(2) **Risk assessor**

- a. Role and responsibilities of a risk assessor.
- b. Collection of background information to perform a risk assessment.
- c. Sources of environmental lead contamination such as paint, surface dust and soil, water, air, packaging, and food.
- d. Visual inspection for the purposes of identifying potential sources of lead-based paint hazards.
- e. Lead hazard screen protocol.
- f. Sampling for other sources of lead exposure.
- g. Interpretation of lead-based paint and other lead sampling results, including all applicable state or Federal guidance or regulations pertaining to lead-based paint hazards.
- h. Development of hazard control options, the role of interim controls, and operations and maintenance activities to reduce lead-based paint hazards.
- i. Preparation of a final risk assessment report.

(3) **Supervisor**

- a. Role and responsibilities of a supervisor.
- b. Background information on lead and its adverse health effects.
- c. Background information on Federal, state, and local regulations and guidance that pertain to lead-based paint abatement.
- d. Liability and insurance issues relating to lead-based paint abatement.
- e. Risk assessment and inspection report interpretation.*
- f. Development and implementation of an occupant protection plan and abatement report.
- g. Lead-based paint hazard recognition and control.*
- h. Lead-based paint abatement and lead-based paint hazard reduction methods, including restricted practices.*
- i. Interior dust abatement/cleanup or lead-based paint hazard control and reduction methods.*
- j. Soil and exterior dust abatement or lead-based paint hazard control and reduction methods.*
- k. Clearance standards and testing.
- l. Cleanup and waste disposal.
- m. Recordkeeping.

(4) **Project designer**

- a. Role and responsibilities of a project designer.
- b. Development and implementation of an occupant protection plan for large scale abatement projects.

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- c. Lead-based paint abatement and lead-based paint hazard reduction methods, including restricted practices for large-scale abatement projects.
 - d. Interior dust abatement/cleanup or lead hazard control and reduction methods for large-scale abatement projects.
 - e. Clearance standards and testing for large scale abatement projects.
 - f. Integration of lead-based paint abatement methods with modernization and rehabilitation projects for large scale abatement projects.
- (5) **Abatement worker**
- a. Role and responsibilities of an abatement worker.
 - b. Background information on lead and its adverse health effects.
 - c. Background information on Federal, state and local regulations and guidance that pertain to lead-based paint abatement.
 - d. Lead-based paint hazard recognition and control.*
 - e. Lead-based paint abatement and lead-based paint hazard reduction methods, including restricted practices.*
 - f. Interior dust abatement methods/cleanup or lead-based paint hazard reduction.*
 - g. Soil and exterior dust abatement methods or lead-based paint hazard reduction.*

APPENDIX H - BLOOD TESTING OF CHILDREN

Children are affected by lead at lower blood lead levels than adults. A child's developing brain and nervous system is more sensitive than an adult's and can be harmed by blood lead levels of less than 10 µg/dL. Children are at greater risk for lead exposure because of crawling, playing on the floor, and placing objects in their mouths. A child's growing body absorbs more lead, especially if the child has poor nutrition. If a child absorbs a similar amount as an adult the smaller body mass would result in a higher blood lead concentration. Even a child who seems healthy could have high levels of blood lead. In order to accurately judge their child's exposure, parents of children ages 6 months to 6 years may ask their private doctor or an IHS doctor to perform a blood lead test on their children. This is a simple test and is the only way to determine if a dangerous level of lead has been absorbed. If a child has a blood lead level of over 10 µg/dL, an investigation should be done and steps should be taken to reduce lead exposures.

The Center for Disease Control and Prevention (CDC) recommended universal screening for all children due to the widespread use of lead paint. However, recently, CDC modified this recommendation because it was not determined to be cost-effective for the few numbers of serious cases of lead poisoning in children. The \$9 fee per test cannot be justified when there are other childhood problems need attention. IHS cannot require testing of an employee's children, but parents should be informed of the risks of lead exposure and of their choice to consider blood lead testing for their children. Many private health insurance policies will cover the cost of the test.

The interpretation of blood lead test results is not a simple matter because of the variability in degrees of lead poisoning with different levels. Studies have shown that harmful effects of lead in children's blood can begin at levels as low as 10 µg/dL. There may be harmful effects at levels lower than 10 µg/dL but these have not been adequately evaluated. Levels between 10 - 14 µg/dL, may indicate borderline lead poisoning. Levels in this range should be retested to rule out lab error. See the chart below for more information on levels of lead poisoning.

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**Blood lead
concentration
($\mu\text{g}/\text{dL}$)**

less than 10

**Follow-up activities for children based on a
blood lead concentration**

A child is not considered to be lead poisoned. Another blood lead test may be taken in a year for follow-up. Inform the doctor if the child lives in a home built before 1978 or in an older home under repair or renovation.

10-14

A child has some exposure to lead. A retest is recommended. If large numbers of children have this concentration, a community-wide effort should be made to reduce lead exposures. Educate parents on hazards of lead dust and paint chips. Check home for lead hazards.

15-19

A child is considered to have an elevated blood lead level. A retest is necessary. If levels remain high, conduct environmental evaluation and intervention. A child's nutrition should be checked and remedied if necessary. Poor nutrition, especially low levels of iron and calcium, enhances lead absorption. Educate parents on nutrition and other interventions.

20-44

A child is considered lead-poisoned. Conduct an environmental evaluation and intervention, and a medical evaluation. Test for iron deficiency. The child may need pharmacological treatment for lead poisoning. At the least, medical management requires removal of the child to a lead-safe environment; correct any iron and calcium deficiency in the diet; and retest the blood lead levels frequently to ensure that they are dropping.

45-69

A child is severely lead poisoned with this level and requires medical and environmental interventions, including chelation therapy. Chelation therapy is the use of drugs which can speed up the excretion of lead. A hospital stay may be required. The child must be removed from lead hazards and stay in a lead-free environment during treatment and recovery in order to get well.

70 and above

An acute medical emergency. Medical and environmental management must begin immediately. Hospitalization and chelation are

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required.